

American National Standard

ANSI A300 (Part 6)-2005 Transplanting

*for Tree Care Operations —
Tree, Shrub, and Other Woody Plant
Maintenance — Standard Practices
(Transplanting)*



ANSI®
A300 (Part 6)-2005

American National Standard
for Tree Care Operations –
Tree, Shrub, and Other Woody Plant Maintenance –
Standard Practices (*Transplanting*)

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American National Standard

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Foreword (This foreword is not part of American National Standard A300 Part 6-2005)

An industry-consensus standard must have the input of the industry that it is intended to affect. The Accredited Standards Committee A300 was approved June 28, 1991. The committee includes representatives from the residential and commercial tree care industry, the utility, municipal, and federal sectors, the landscape and nursery industries, and other interested organizations. Representatives from varied geographic areas with broad knowledge and technical expertise contributed.

The A300 standards are placed in proper context if one reads the Scope, Purpose, and Application. This document presents performance standards for the care and maintenance of trees, shrubs, and other woody plants. It is intended as a guide in the drafting of maintenance specifications for federal, state, municipal, and private authorities including property owners, property managers, and utilities.

The A300 standards stipulate that specifications for tree work should be written and administered by a professional possessing the technical competence to provide for, or supervise, the management of woody landscape plants. Users of this standard must first interpret its wording, then apply their knowledge of growth habits of certain plant species in a given environment. In this manner, the users ultimately develop their own specifications for plant maintenance.

ANSI A300 Part 6 – *Transplanting*, should be used in conjunction with the rest of the A300 standard when writing specifications for tree care operations.

Suggestions for improvement of this standard should be forwarded to: A300 Secretary, c/o Tree Care Industry Association, 3 Perimeter Road – Unit 1, Manchester, NH 03103, USA or e-mail: tcia@treecareindustry.org

This standard was processed and approved for submittal to ANSI by Accredited Standards Committee on Tree, Shrub, and Other Woody Plant Maintenance Operations – Standard Practices, A300. Committee approval of the standard does not necessarily imply that all committee members voted for its approval. At the time it approved this standard, the A300 committee had the following members:

Tim Johnson, Chair
(Artistic Arborist, Inc.)
Bob Rouse, Secretary
(Tree Care Industry Association, Inc.)

<i>Organizations Represented</i>	<i>Name of Representative</i>
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	<i>Warren Quinn (Alt.)</i>
<i>American Society of Consulting Arborists</i>	<i>Tom Mugridge</i>
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<i>Asplundh Tree Expert Company</i>	<i>Geoff Kempter</i>
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<i>Davey Tree Expert Company</i>	<i>Joseph Tommasi</i>
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<i>International Society of Arboriculture</i>	<i>John Ball</i>
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Beth Palys (Observer)
Peter Gerstenberger (Observer)
Myron Laible (Observer)
Richard Rathjens (Observer)
Richard Roux (NFPA-780 Liaison)
Sharon Lilly (Observer)

American National Standard for Tree Care Operations –

Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices (*Transplanting*)

Clause 1 excerpted from ANSI A300 (Part 1) – 2001 Pruning

1 ANSI A300 standards

1.1 Scope

ANSI A300 standards present performance standards for the care and maintenance of trees, shrubs, and other woody plants.

1.2 Purpose

ANSI A300 standards are intended as guides for federal, state, municipal, and private authorities including property owners, property managers, and utilities in the drafting of their maintenance specifications.

1.3 Application

ANSI A300 standards shall apply to any person or entity engaged in the business, trade, or performance of repairing, maintaining, or preserving trees, shrubs, or other woody plants.

1.4 Implementation

Specifications for tree maintenance should be written and administered by an arborist.

60 Part 6 – Transplanting standards

60.1 Purpose

The purpose of this document is to provide standards for developing specifications for transplanting and planting trees and shrubs.

60.2 Reasons for transplanting

Transplanting is performed to relocate landscape plants to meet specific objectives. Horticultural production or silvicultural purposes are exempt from this standard.

60.3 Safety

60.3.1 This standard shall not take precedence over arboricultural safe work practices.

60.3.2 Operations shall comply with applicable Department of Transportation (DOT) standards, Occupational Safety and Health Administration (OSHA) standards, ANSI Z133.1, as well as state and local regulations.

60.3.3 The sites shall be inspected for hazards prior to beginning any transplanting procedure.

60.3.3.1 The location of utilities and other obstructions both below and above ground shall be taken into consideration prior to transplanting any tree or plant. Utilities and other obstructions include, but are not limited to gas, electric, communications, sewer, drainage, signage, overpasses, or bridges. Locations include the plant source site, the entire transportation route, and the planting site. Transplanting shall comply with all legal and regulatory requirements for identifying and marking utilities and for highway transport.

61 Normative references

The following standards contain provisions that, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

ANSI Z60.1, *Nursery stock*

ANSI Z117.1, *Safety Requirements for Confined Spaces*

ANSI Z133.1, *for Arboricultural Operations – Pruning, Trimming, Repairing, Maintaining, and Removing Trees, and Cutting Brush – Safety Requirements*

ASME B30, *Cranes, Derricks, Hoists, Hooks, Jacks, and Slings*.

29 CFR 1910, *General Industry*¹⁾

29 CFR 1910.146, *Permit-required Confined Spaces (PRCS)*¹⁾

29 CFR 1910.268, *Telecommunications*¹⁾

29 CFR 1910.269, *Electric Power Generation & Distribution*¹⁾

29 CFR 1910.331-335, *Electrical Safety*¹⁾

62 Definitions

62.1 arborist: An individual engaged in the profession of arboriculture who, through experience, education and related training, possesses the competence to provide for, or supervise the management of, trees and other woody plants.

62.2 balled and wrapped: Plants established in the ground that have been prepared for transplanting by digging so that the soil immediately around the roots remains undisturbed. The ball of earth containing the roots of the plant is then bound up.

62.3 bare root (B.R.): Harvested plants from which the soil or growing medium has been removed.

62.4 boxed: A method for protecting roots that includes digging a trench, constructing and installing a box around the roots, and then using the box to lift, transport, and install the landscape plant.

62.5 burlap: A loose-weave fabric that is used to protect plant parts and/or add support to root balls during transplanting operations.

62.5.1 chemically treated burlap: A fabric treated with chemical preservative that biodegrades at a very slow rate.

62.5.2 combination burlap: A fabric with both natural and synthetic fibers that biodegrades at a slow rate.

62.5.3 natural burlap: A material that is 100 per cent biodegradable.

62.5.4 synthetic burlap: A material that is not biodegradable.

62.6 caliper: In the landscape or nursery trade, this is the diameter of a tree, measured at a point 6 inches (15 cm) above the ground line if the resulting measurement is no more than 4 inches (10 cm). If the resulting measurement is more than 4 inches (10 cm), the measurement is made at a point 12 inches (30 cm) above the ground line. This in contrast to the method used to measure caliper in the timber industry, which is to make the measurement at a point 4.5 feet (1.4 m) above the ground line, or the “diameter at breast height” (D.B.H.).

62.9 crown: The leaves and branches of a tree measured from the lowest branch on the trunk to the top of the tree.

62.10 D.B.H. [diameter at breast height]: Measurement of trunk diameter taken at 4.5 feet (1.4 m) off the ground.

62.11 digging spade: A specially designed shovel used to dig, shape and form a root ball.

62.12 drum lace: A specific pattern for tying that holds and supports the root ball when transplanting landscape plants with the balled and wrapped method.

62.13 foam protection: A pre-formed soft foam sheet, pad, or pipe insulation.

62.14 girdling root: A root that may impede proper development of other roots, trunk flare, and/or trunk.

62.15 grade: a datum or reference level, specifically ground level.

62.16 guy: A steel cable or synthetic-fiber cable system installed between a tree and an external anchor to provide supplemental support.

62.17 installation site: The location at which the landscape plant will be installed.

62.18 landscape plants: Trees and woody shrubs.

62.19 lifting chain, certified: A chain certified for a rated load capacity.

¹⁾Available from U.S. Department of Labor, 200 Constitution Avenue, NW, Washington, DC 20210.

62.20 lifting sling, certified: A sling certified for a rated load capacity.

62.21 lifting strap, certified: A strap certified for a rated load capacity.

62.22 percolation test: As used in this standard, a field test conducted to determine water infiltration rate.

62.23 planting: Installing a plant in the landscape.

62.24 protective material: Fabric or device used to limit injury to any portion of the landscape plant during preparation and transplanting operations.

62.25 root ball: The root mass of a tree or shrub after digging or removal from a container.

62.26 root collar: The transition zone between the trunk and the root system.

62.27 root pruning: The cutting of roots to meet specific goals and objectives.

62.28 shall: As used in this standard denotes a mandatory requirement.

62.29 should: As used in this standard denotes an advisory recommendation.

62.30 soil amendment: Any material added to soil to alter its composition and structure, such as sand, fertilizer, or organic matter.

62.31 soil anchor: A device driven, buried, or otherwise inserted into the ground to which a guy is attached.

62.32 specifications, industry-standard: Details that set result-orientated expectations for the manufacture of a specific product or provision of a specific service, written in compliance with industry-consensus standards.

62.33 spreader bar: An apparatus used to spread the lifting chain or strap to avoid damage to the root ball and crown.

62.34 standards, industry-consensus: A set of parameters developed by a group of materially affected parties in accordance with accepted essential requirements for openness, balance, consensus and due process. The parameters provide the mini-

mum requirements and recommendations for manufacture of products, provision of services, or safety.

62.35 tensiometer: An instrument for determining the moisture content of soil.

62.36 thimble: An oblong galvanized or stainless steel fitting with flared margins and an open-ended base.

62.37 transplanting: The process of relocating an existing plant in the landscape.

62.38 tree spade: Equipment used to transplant large trees.

62.39 tree wrap: Material installed on a tree trunk to protect it from injury.

62.40 trunk flare: 1. The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots. 2. The area of transition between the root system and the stem or trunk.

62.41 turnbuckle: A drop-forged, closed eye device for adjusting tension.

62.42 wire basket: A balled and wrapped method (see 62.2) using a pre-fabricated wire mesh basket for support of the root ball.

62.43 wire-wrapped: A balled and wrapped method (see 62.2) using wire or a wire mesh for support of the root ball.

63 Transplanting practices

63.1 Transplanting objectives

Transplanting objectives shall be established prior to beginning operations.

63.2 Plant and site inspection

63.2.1 Compass orientation of trees and shrubs shall be considered.

63.2.2 Ball sizes should be of a diameter and depth to encompass enough of the root system as necessary for establishment. ANSI Z60.1 provides a reference for caliper sizes under 8 inches (20 cm).

63.2.3 Trees with a D.B.H. over 8 inches (20 cm) should have 12 inches (30 cm) or more of root ball diameter for every inch (2.54 cm) of trunk diameter.

63.2.4 Root pruning should be considered prior to transplanting.

63.2.5 A feasibility and suitability assessment shall be conducted prior to recommending transplanting.

63.2.6 Specifications for transplanting should be based on the assessment. See checklist in **Annex A**.

63.2.7 A soil nutrient analysis, density, texture and percolation test should be performed at the installation site.

63.2.8 Drainage should be adequate for the species being transplanted.

63.2.9 Potential conflict with utilities, lines of sight, buildings, and other infrastructure should be avoided. Tall-growing trees shall not be planted directly under overhead primary distribution and transmission electric lines.

63.2.10 If a condition is observed while the work is being performed requiring attention beyond the original scope of work, the condition shall be reported to an immediate supervisor, the owner, or person responsible for authorizing the work.

63.3 Tools and equipment

63.3.1 Equipment and work practices that cause damage to the plant, beyond the scope of the work, should be avoided.

63.3.2 Digging and root pruning tools shall be sharp in order to cut without breaking, crushing, or tearing roots.

63.3.3 Mechanical digging and root pruning equipment shall be maintained according to manufacturers' recommendations to minimize root damage.

63.3.4 Lifting cables, chains, straps, and/or slings shall be inspected and certified (see **Annex B**).

63.3.5 Certified lifting cables, chains, straps, and slings shall be used according to manufacturers' instructions and specifications.

63.4 General

63.4.1 The requirements of the individual trees and shrubs shall be considered.

63.4.2 Timing of transplanting

63.4.2.1 Season and phenology of the tree or shrub shall be taken into consideration.

63.4.2.2 Transplanting should occur during the optimum time of year for the species.

63.5 Transplanting practices

63.5.1 Compass orientation of trees and shrubs shall be considered.

63.5.2 Ball sizes should be of a diameter and depth to encompass enough of the root system as necessary for establishment. ANSI Z60.1 provides a reference for caliper sizes under 8 inches (20 cm).

63.5.3 Trees with a D.B.H. over 8 inches (20 cm) should have 12 inches (30 cm) or more of root ball diameter for every inch (2.54 cm) of trunk diameter.

63.5.4 Root ball size shall be specified.

63.5.5 Trunk should be centered in the root ball.

63.5.6 The following shall be considered prior to digging:

- a. root pruning;
- b. crown pruning;
- c. trunk flare depth;
- d. moisture content;
- e. storage;
- f. support systems;
- g. transport; and,
- h. fertilization.

63.5.7 Sites shall be prepared to accept digging operations.

63.5.8 Protection

63.5.8.1 Root ball, trunk, and crown shall be protected from damage beyond the scope of the work.

63.9 Post-planting care practices

63.9.1 Post-planting care shall be specified for an appropriate period of time in consideration of region, site conditions, and species.

63.9.2 Post-planting care for a minimum of one year should be considered.

63.9.3 Specifications for post-planting care should consist of, but are not limited to, one or more of the following:

- a. soil moisture management;
- b. mulching;
- c. integrated pest management;
- d. pruning (see ANSI A300 Part 1 – *Pruning* standard);
- e. monitoring;
- f. nutrient management (see ANSI A300 Part 2 – *Fertilization* standard); and,
- g. maintenance/removal of tree support systems (see ANSI A300 Part 3 – *Support Systems* standard).

Annex A
(Informative)

Transplanting information

- A-1** Plants with significant defects may not be considered acceptable candidates for transplanting.
- A-2** **Initial assessment checklist:**
- a. general health of the landscape plant(s) including foliage color and density, signs of insect and disease, and past care;
 - b. structural condition of the landscape plant(s) including the root system, present defects, past injuries, crown shape, and growing environment;
 - c. species data for tolerance of transplanting;
 - d. crown shape;
 - e. size of root ball/quality of root system;
 - f. foliage color or density;
 - g. effects of pruning before transplanting; and,
 - h. any other related issue that will impact the estimated rate of success.
- A-3** The following shall be evaluated in the initial assessment of the existing site and the installation site:
- a. above and below ground hazards;
 - b. access;
 - c. soil conditions;
 - d. obstacles;
 - e. slope;
 - f. utilities; and,
 - g. critical structures, i.e. rooftop plantings.

63.5.9 Digging the tree or shrub

63.5.9.1 The following methods should be considered when specifying a tree or shrub for relocation:

- a. Balled and wrapped;
- b. Bare root;
- c. Boxed; and,
- d. Tree spade.

63.5.9.2 Mechanical and hand digging operations should start outside the finished root ball size, exception: Mechanical tree spade.

63.5.9.3 Balled and wrapped

63.5.9.3.1 Methods and materials used to protect or secure the root ball shall hold the ball firmly.

63.5.9.4 Boxed

63.5.9.4.1 Box sides shall be tight against the root ball.

63.5.9.4.2 Box sides should be fastened together to limit movement.

63.5.9.4.3 Box bottom, if installed, shall be tight against the root ball.

63.5.9.4.4 Box top shall be installed if the box will be tilted during transport.

63.5.9.5 Tree spade

63.5.9.5.1 Clearance between the tree or shrub and tree spade shall be provided.

63.5.9.5.2 Tree spade shall be free of fluid leaks with blades properly aligned.

63.5.9.5.3 Adjustments shall be made for differences between slope of the old and new site.

63.5.10 Lifting

63.5.10.1 Prior to lifting root balls, roots should be separated from the surrounding soil.

63.5.10.2 The system used for lifting shall prevent damage to the root ball, trunk, and crown.

63.5.10.3 Spreader bars should be used to distribute forces away from the root ball and to provide crown clearance.

63.5.11 Transporting

63.5.11.1 The system used for transporting shall minimize dessication and other damage to crown, trunk, and root ball.

63.5.12 Storing trees and shrubs before planting

63.5.12.1 The health and vigor of the trees or shrubs shall be maintained during storage.

63.6 Planting

63.6.1 Digging the hole

63.6.1.1 The final depth of the planting hole is determined by the depth and firmness of the root ball and other characteristics of the site and shall not exceed the depth of the root ball.

63.6.1.2 The depth of the root ball shall be measured from the bottom of the trunk flare to the bottom of the ball.

63.6.1.3 The soil directly beneath the root ball should be undisturbed or prepared to prevent settling.

63.6.1.4 The planting hole width should be a minimum of 1.5 times the diameter of the root ball.

63.6.1.5 The sides of the planting hole should be scarified.

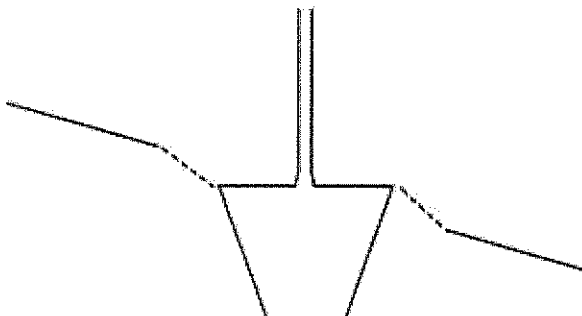


Fig. 63.5.9.5.3 Example of an adjustment made for differences in slope.

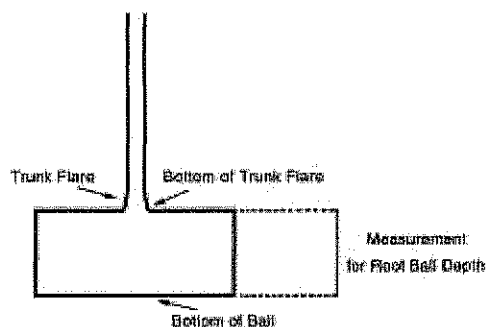


Fig. 63.6.1.2 A discernable trunk flare and related measurements.

63.6.2 Installing the tree or shrub

63.6.2.1 Trees or shrubs should be placed in the same compass orientation from which they originated.

63.6.2.2 Bare root plants should be installed so that their root system is evenly distributed in the planting hole.

63.6.2.3 The bottom of the trunk flare shall be at or above the finished grade.

63.6.2.4 All root ball supporting materials should be cut-off from the top third of the root ball and removed from the planting hole prior to final back filling.

63.6.2.5 Backfill should be similar to the soil at the planting site or amended to meet a specific objective.

63.6.2.6 The back-fill soil shall be installed and settled in layered sections to limit future settling and prevent air pockets.

63.6.2.7 Backfill shall not be compacted to a density that inhibits root growth.

63.6.2.8 Water should be added to the root ball and backfill to bring the root ball to field capacity.

63.6.2.9 Mulch should be applied near, but not touching, the trunk out to the perimeter of the planting. Initial depth of organic mulch should be between 2 and 4 inches (5 and 10 cm).

63.6.2.10 Mulch type shall be specified to meet an objective.

63.7 Support systems

63.7.1 Support systems shall not be specified or installed except when needed.

63.7.2 Support systems shall be installed according to ANSI A300 Part 3 *Support Systems*.

63.8 Specialty transplanting practices

63.8.1 Palms

63.8.1.1 The minimum root ball radius should be 6 inches (15 cm) from the base of the trunk at ground level. Root balls larger than the minimum radius shall be preferred.

63.8.1.2 The root ball should have adequate mass and depth to structurally support the tree.

63.8.1.3 The root ball depth should be at least 1.5 times the root ball diameter or width.

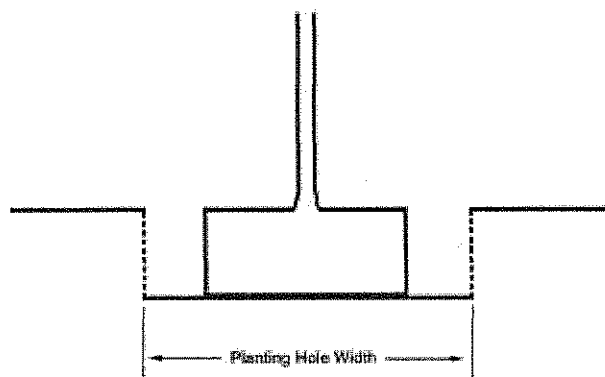


Fig. 63.6.1 Example of a properly prepared planting hole.

Annex B
(Informative)

Lifting chain and sling, proper inspection and record-keeping protocol

B-1 Each sling must be affixed with a permanent tag clearly showing the sling's working load limit, type, size, serial number, and manufacturer.

B-2 Each sling should have its own record-keeping file.

B-3 Each sling must have a proof test certificate kept on file for inspectors and company use showing the sling's working load limit, type, size, serial number, lot number, and manufacturer. The proof test shows that the sling is fully OSHA compliant.

B-4 Each sling must have an annual inspection card filed in order to comply with OSHA standards. Each sling must be inspected at least once a year for nicks, gouges, and other defects that might make it unsafe. The inspection card is proof that a qualified person has made these inspections.

